527 Rec'd PCT/PT 17 NOV 2000

FORM-PTO-1
(Rev. 12-29-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/PS) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 027566-021

U S APPLICATION NO. (If known, see 37 C F R 1 5): Unassigned 09/700585

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/FI99/00424	17 May 1999	18 May 1998

TITLE OF INVENTION
CALL INFORMATION OUTPUT IN A TELECOMMUNICATION NETWORK

APPLICANT(S) FOR DO/EO/US
Mikko, LIPSANEN; Patrik Kim NILSSON; Patrik Kjell-Johan PALM

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

International Preliminary Examination Report; PCT Demand; PCT Request; Unexecuted Declaration

529 Rec'd PCT/PTO 17 NOV 2000

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
Unassigned 09/700585	PCT/FI99/00424	027566-021

17. ☒ The following fees are submitted:	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1,000.00 (960)		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $860.00 (970)		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $710.00 (958)		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) $690.00 (956)		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00 (962)		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 1,000.00	
Surcharge of **$130.00 (154)** for furnishing the oath or declaration later than 20 ☐ 30 ☐ months from the earliest claimed priority date (37 CFR 1.492(e)).	$ ---	

Claims	Number Filed	Number Extra	Rate		
Total Claims	9 -20 =	0	X$18.00 (966)	$ - 0 -	
Independent Claims	3 -3 =	0	X$80.00 (964)	$ - 0 -	
Multiple dependent claim(s) (if applicable)			+$270.00 (968)	$ ---	
TOTAL OF ABOVE CALCULATIONS =				$ 1,000.00	
Reduction for 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				$ ---	-
SUBTOTAL =				$ 1,000.00	
Processing fee of **$130.00 (156)** for furnishing the English translation later than 20 ☐ 30 ☐ months from the earliest claimed priority date (37 CFR 1.492(f)). +				$ ---	
TOTAL NATIONAL FEE =				$ 1,000.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00 (581)** per property +				$ ---	
TOTAL FEES ENCLOSED =				$ 1,000.00	
				Amount to be: refunded	$
				charged	$

a. ☒ A check in the amount of $ 1,000.00 to cover the above fees is enclosed.

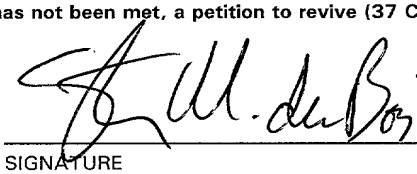
b. ☐ Please charge my Deposit Account No. 02-4800 in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Ronald L. Grudziecki
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620



SIGNATURE

Steven M. du Bois
NAME

35,023
REGISTRATION NUMBER

Patent
Attorney's Docket No. 027566-021

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
	)	
Mikko LIPSANEN et al.	)	Group Art Unit: Unassigned
	)	
Application No.: Unassigned	)	Examiner: Unassigned
	)	
Filed: November 17, 2000	)	
	)	
For: CALL INFORMATION OUTPUT IN A TELECOMMUNICATION NETWORK	)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend claim 5 and 8 as follows:

Claim 5, lines 1 and 2, delete "any one of the preceding claims" and insert therefor --claim 1--.

Claim 8, line 1, delete "or 7".

REMARKS

The above amendments to the claims have been made in order to eliminate multiple dependencies. Favorable action on the merits of the application is respectfully requested.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: _____
Steven M. du Bois
Registration No. 35,023

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: November 17, 2000

CALL INFORMATION OUTPUT IN A TELECOMMUNICATION NETWORK

Field of the Invention

The present invention relates to a method and apparatus for outputting call information in a telecommunication network.

Background to the Invention

In telecommunication networks such as fixed access networks and cellular radio telephone networks there is usually a need to record call information at at least one exchange of the network. This information may include the identity of a caller (A-number), the identity of the called party (B-number), and the duration of a call. In cellular radio telephone networks, the recorded information may also include the International Mobile Subscriber Identity (IMSI) code of the Subscriber Identity Module (SIM) used with the calling mobile telephone, and the International Mobile Equipment Identity (IMEI) code of the calling telephone itself. Both the IMSI and IMEI codes are typically sent by a mobile telephone to the cellular network during a call set-up phase. For a given call, a record stored in an exchange is normally output to a centralised billing system of the network upon termination of the call. Historically, this record has been referred to as a "Toll Ticket" (TT) although more recently the term "Call Data Record" (CDR) has been used.

US5,506,893 describes a telecommunication network in which a CDR is output from a switching centre to an external billing system upon termination of a call.

Summary of the Invention

According to a first aspect of the present invention there is provided a method of providing information relating to a telecommunication call, in a telecommunication network, to a data storage system, the method comprising:

receiving caller identity information at an exchange of the network during a call set-up procedure between a calling device and the exchange, and storing the information at least temporarily at the exchange;

sending an incoming call alert message to a called device;

prior to receiving a call answer message at the exchange, or in direct response to receipt of a call answer message, outputting from the exchange to said data storage system a Call Data Record containing at least the received caller identity information.

Embodiments of the present invention provide for the output of call information at a very early stage in a call, i.e. immediately following the answering of the call or during the call set-up phase. This makes possible, for example, real-time billing and fraud detection prior to or during a call.

In certain embodiments of the present invention, the telecommunication network comprises a cellular radio telephone network and the call is made from a cellular radio telephone device. The exchange from which the call information is output is then the Mobile Switching Centre (MSC). The information may include at least one of the subscriber telephone number, IMEI code, IMSI code, or B-number.

In other embodiments of the present invention, the telecommunication network comprises a fixed access

network in which telephone device is coupled to the exchange via land lines. The information output by the exchange preferably includes the caller's telephone number (A-number) and the called number (B-number).

According to a second aspect of the present invention there is provided apparatus for providing information relating to a telecommunication call, in a telecommunication network, to a data storage system, the apparatus comprising:

first receiving means for receiving caller identity information at an exchange of the network during a call set-up procedure between a calling device and the exchange, and for storing the information at least temporarily at the exchange;

transmitting means for transmitting an incoming call alert message to a called device;

second receiving means for receiving, in the event that the called device answers or otherwise accepts the incoming call alert, a call answer message sent to the exchange; and

output means for outputting, prior to, or in response to, receipt of said call answer message, from the exchange to said data storage system, a Call Data Record containing at least the received caller identity information.

Preferably, said first and second receiving means, said transmitting means, and said output means are provided as an integral part of the network exchange. Where the network comprises a cellular radio telephone network, the exchange is a Mobile Switching Centre (MSC). The MSC may be contained within a housing which is physically spaced apart from an external billing system which is arranged to receive the Call Data Record output by the MSC. More preferably, a plurality of MSCs are

arranged to provide the output CDRs to a common external billing system.

According to a third aspect of the present invention there is provided a telecommunication network having a plurality of interconnected exchanges for routing calls in the network, and a common billing system coupled to each of said exchanges, each exchange comprising:

first receiving means for receiving caller identity information during a call set-up procedure between a calling device and the exchange, and for storing the information at least temporarily at the exchange;

transmitting means for transmitting an incoming call alert message to a called device or to a called device via one or more further exchanges;

second receiving means for receiving, in the event that the called device answers or otherwise accepts the incoming call alert, a call answer message sent to the exchange; and

output means for outputting, prior to or in response to receipt of said call answer message, from the exchange to a data storage system, a Call Data Record containing at least the received caller identity information.

Brief Description of the Drawings

For a better understanding of the present invention and in order to show how the same may be carried into effect reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 shows schematically a telecommunication network including a cellular radio telephone network;

Figure 2 is a flow diagram illustrating the method of operation of the telecommunication network of Figure 1; and

Figure 3 illustrates an external billing system shared by a number of Mobile Switching Centres of a cellular radio telephone network.

Detailed Description of Embodiments

There is shown in Figure 1 a telecommunication network comprising a Global System for Mobile Communications (GSM) cellular radio telephone network and a fixed access network. The former consists of a Mobile Switching Centre (MSC) 1, a set of Base Station Controllers (BSC) 2 only one of which is shown in Figure 1, and a set of Base Transceiver Stations (BTS) 3 again only one of which is shown in the Figure. The MSC, BSCs, and BTSs provide functionality as defined in the relevant European Telecommunications Standards Institute (ETSI) GSM standards.

In the GSM network, mobile stations such as that indicated by reference numeral 4 communicate with a BTS 3 over the air interface. User data and signaling messages are coupled between the BTS 3 and the MSC 1 via the BSC 2. The MSC 1 acts as an exchange of the GSM network, routing calls between a mobile station 4 and a called, or calling, station.

In the example of Figure 1, the destination of a call from the mobile station 4 is a land line telephone 5 which belongs to a subscriber of a fixed access network 6. A call may be routed through several intermediate exchanges (e.g. in the case of an international call) and may also pass through several exchanges of the fixed access network, although for the sake of clarity these exchanges are not shown in Figure 1. In the same way, it will be appreciated that a call may be routed through several MSCs 1 en route from the mobile station 4 to the fixed line telephone 5.

The mobile station 4 is provided with a Subscriber Identity Module (SIM) 7 which contains a solid state memory arranged to store a unique International Mobile Subscriber Identity (IMSI) code. The mobile station 4 itself has a solid state memory arranged to store a second unique code known as an International Mobile Equipment Identity (IMEI) code. The form of these two codes is defined in the relevant GSM standard.

When a user of the mobile terminal 4 places a call to the fixed line telephone 5 by dialing the B-number of that telephone, at least the IMSI code and the telephone number (A-number) assigned to the mobile terminal 4 are transmitted to an input/output device 8 of the MSC 1 on a signaling channel of the GSM network (the IMEI code may or may not be sent at this stage). In response to the call request, the MSC 1 first verifies the right of the mobile terminal 4 to use the services of the GSM network on the basis of the A-number and the IMSI code (e.g. using a database of subscribers of the GSM network).

Assuming that the mobile terminal 4 receives authorisation from the MSC 1 to place the call, the MSC 1 transmits an incoming call request from an output/output device 9 to the fixed line telephone 5 via the fixed access telephone network. A signaling protocol such as the Signaling System 7 (SS7) is used to relay the request between the MSC 1 and the various exchanges. When the request reaches the fixed line telephone 5, the phone rings in the normal manner.

If the call is answered at the fixed line telephone 5, then a call answer message is returned to the fixed access network 6, either by the telephone 5 or by some intermediate device, e.g. a concentrator. The call

answer message is also transmitted back to the input/output device 9 of the MSC 1 of the GSM network, again using the SS7 signaling protocol.

Connected to the MSC 1 of the GSM network is a so-called input/output group device or external billing system 10. This may be a personal computer (PC), work station, data storage device or the like, which logs information concerning calls switched by the MSC 1. The information recorded by the external billing system 10 enables the operator of the GSM network to charge subscribers, trace calls, and identify calls made from "illegal" equipment. The latter is achieved using the transmitted IMSI code and also the IMEI code (if transmitted).

When the call answer message is received by the MSC 1 from the fixed line telephone 5, the MSC 1 provides a traffic channel (i.e. voice or data) to the mobile station 4 enabling the mobile subscriber to communicate with the fixed line telephone. In addition, receipt of the call answer message causes the MSC 1 to output to the external billing system 10, via an input/output device 11, the caller's A-number, IMSI code, the called party's B-number, and the call start time. This data is in the form of a partial Charging Data Record (CDR) and is recorded by the external billing system 10. When the call is terminated by one of the parties to the call hanging-up, a call termination message is received by the MSC, and a call end time output to the input/output group device 10 to complete the partial CDR.

Figure 2 is a flow chart illustrating the method of operation of the network of Figure 1, and relates in particular to the output of the CDR to the external billing system 10.

The external billing system is physically separate from the MSC (1) which is usually contained within a single large housing. By transferring the partial CDR, upon receipt of the call answer message from the B-subscriber, to the external billing system the network operator is able to access the record at an early stage in a call for the purposes already set out above.

The external billing system is typically shared by a number of MSCs 1 of the GSM network. This is illustrated in Figure 3.

It will be appreciated by the person of skill in the art that various modifications may be made to the above described embodiment without departing from the scope of the present invention. For example, the exchange from which the CDR is output may be an exchange of a fixed access network rather than that of a cellular radio telephone network. In another modification, the partial CDR is output from the exchange to the external billing system during the call set-up phase, i.e. prior to the call answer message being received at the exchange from the B-subscriber. The CDR provided to the external billing system may include additional information such as the MSC identity, and the originating/terminating cell identity (Cell Global Identity) in the GSM network.

Claims

1. A method of providing information relating to a telecommunication call, in a telecommunication network, to a data storage system, the method comprising:

receiving caller identity information at an exchange of the network during a call set-up procedure between a calling device and the exchange, and storing the information at least temporarily at the exchange;

sending an incoming call alert message to a called device;

prior to receiving a call answer message at the exchange, or in direct response to receipt of a call answer message, outputting from the exchange to said data storage system a Call Data Record containing at least the received and stored caller identity information.

2. A method according to claim 1, wherein the telecommunication network comprises a cellular radio telephone network and the call is made from a cellular radio telephone device.

3. A method according to claim 2, wherein the cellular radio telephone network is a GSM network and said exchange from which the Call Data Record is output is a Mobile Switching Center, the method comprising outputting from the Mobile Switching Center at least one of the subscriber telephone number, IMEI code, or IMSI code.

4. A method according to claim 1, wherein the telecommunication network comprises a fixed access network in which telephone device is coupled to the exchange via land lines, the method comprising outputting from the exchange at least the caller's telephone number (A-number).

5. A method according to any one of the preceding claims and comprising outputing said call data record to an external billing system.

6. Apparatus for providing information relating to a telecommunication call, in a telecommunication network, to a data storage system (10), the apparatus comprising:

first receiving means (8) for receiving caller identity information at an exchange (1) of the network during a call set-up procedure between a calling device (4) and the exchange (1), and for storing the information at least temporarily at the exchange (1);

transmitting means (9) for transmitting an incoming call alert message to a called device (5);

second receiving means (9) for receiving, in the event that the called device (5) answers or otherwise accepts the incoming call alert, a call answer message sent to the exchange (1); and

output means (11) for outputting, prior to or in response to receipt of said call answer message, from the exchange (1) to said data storage system (10), a Call Data Record containing at least the received and stored caller identity information.

7. Apparatus according to claim 6, wherein said first and second receiving means (8,9), said transmitting means (9), and said output means (11) are provided as an integral part of the network exchange (1), and said data storage system (10) is physically separate from the exchange (1).

8. Apparatus according to claim 6 or 7, the network comprising a cellular radio telephone network and said exchange (1) being a Mobile Switching Centre (MSC) of the cellular network.

9. A telecommunication network having a plurality of interconnected exchanges for routing calls in the network, and a billing system coupled to each of said exchanges, each exchange comprising:

first receiving means (8) for receiving caller identity information during a call set-up procedure between a calling device (4) and the exchange (1), and for storing the information at least temporarily at the exchange (1);

transmitting means (9) for transmitting an incoming call alert message to a called device (5) or to a called device (5) via one or more further exchanges (1);

second receiving means (9) for receiving, in the event that the called device (5) answers or otherwise accepts the incoming call alert, a call answer message sent to the exchange (1); and

output means (11) for outputting, prior to or in response to receipt of said call answer message, from the exchange (1) to a data storage system (10), a Call Data Record containing at least the received and stored caller identity information.

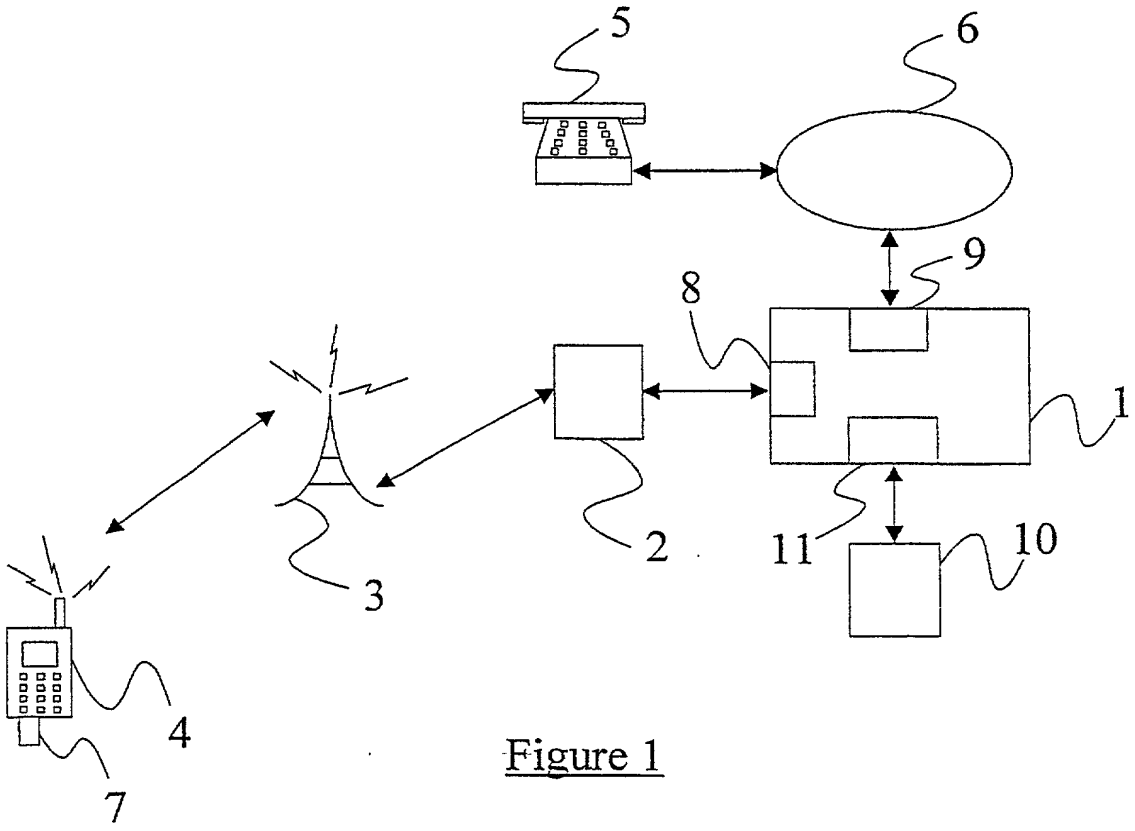


Figure 1

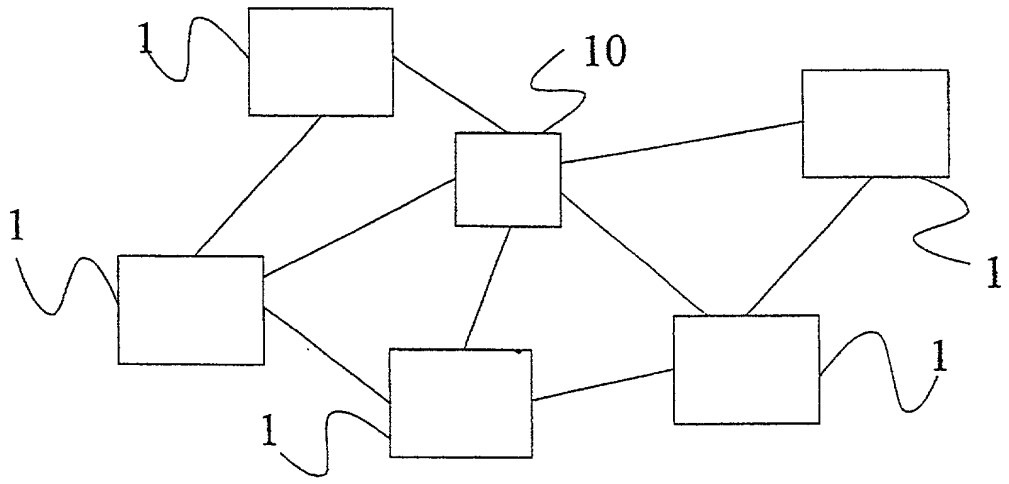


Figure 3

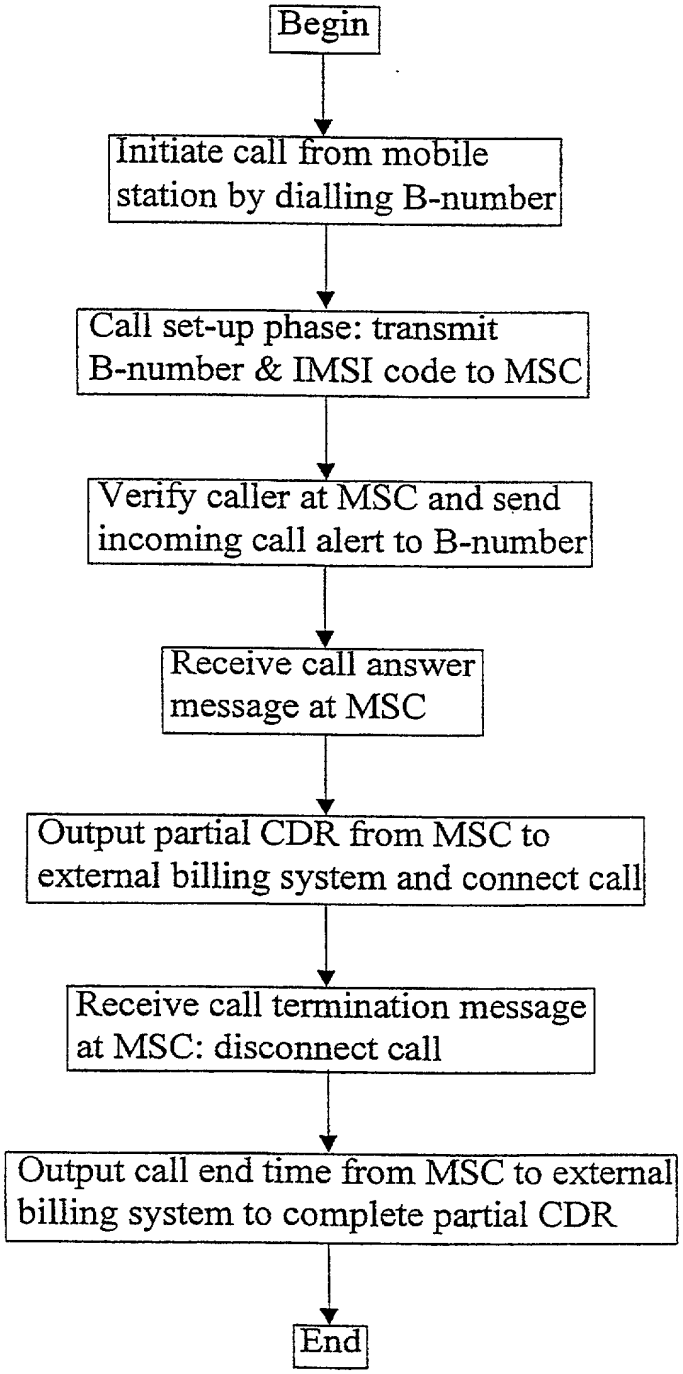

Begin
Initiate call from mobile station by dialling B-number
Call set-up phase: transmit B-number & IMSI code to MSC
Verify caller at MSC and send incoming call alert to B-number
Receive call answer message at MSC
Output partial CDR from MSC to external billing system and connect call
Receive call termination message at MSC: disconnect call
Output call end time from MSC to external billing system to complete partial CDR
End

Figure 2

US LMF 98021

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to Provisional and PCT International Applications)	Attorney's Docket No. 027566-021

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name;
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CALL INFORMATION OUTPUT IN A TELECOMMUNICATION NETWORK

the specification of which (check only one item below):

☐ is attached hereto.

☒ was filed as United States application
Number 09/700,585
on November 17, 2000
and was amended
on November 17, 2000 (if applicable).

☐ was filed as PCT international application
Number _____
on _____
and was amended
on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
Finland	981105	18 May 1998	X Yes _ No
			_ Yes _ No
			_ Yes _ No
			_ Yes _ No
			_ Yes _ No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

_____ (Application Number) _____ (Filing Date)

_____ (Application Number) _____ (Filing Date)

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONT'D) (Includes Reference to Provisional and PCT International Applications)	Attorney's Docket No. 027566-021

I hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations §1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. §120:

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NUMBERS ASSIGNED (if any)		
PCT/FI99/00424	17 May 1999	Unassigned		X

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

William L. Mathis	17,337	R. Danny Huntington	27,903	Gerald F. Swiss	30,113
Robert S. Swecker	19,885	Eric H. Weisblatt	30,505	Charles F. Wieland III	33,096
Platon N. Mandros	22,124	James W. Peterson	26,057	Bruce T. Wieder	33,815
Benton S. Duffett, Jr.	22,030	Teresa Stanek Rea	30,427	Todd R. Walters	34,040
Norman H. Stepno	22,716	Robert E. Krebs	25,885	Ronni S. Jillions	31,979
Ronald L. Grudziecki	24,970	William C. Rowland	30,888	Harold R. Brown III	36,341
Frederick G. Michaud, Jr.	26,003	T. Gene Dillahunty	25,423	Allen R. Baum	36,086
Alan E. Kopecki	25,813	Patrick C. Keane	32,858	Steven M. duBois	35,023
Regis E. Slutter	26,999	B. Jefferson Boggs, Jr.	32,344	Brian P. O'Shaughnessy	32,747
Samuel C. Miller, III	27,360	William H. Benz	25,952	Kenneth B. Leffler	36,075
Robert G. Mukai	28,531	Peter K. Skiff	31,917	Fred W. Hathaway	32,236
George A. Hovanec, Jr.	28,223	Richard J. McGrath	29,195		
James A. LaBarre	28,632	Matthew L. Schneider	32,814		
E. Joseph Gess	28,510	Michael G. Savage	32,596		

21839

and: _____

Address all correspondence to:

21839

Ronald L. Grudziecki
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, Virginia 22313-1404

Address all telephone calls to: Steven M. du Bois at (703) 836-6620.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon

(10/0

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONT'D) (Includes Reference to Provisional and PCT International Applications)	Attorney's Docket No. 027566-021

1-00

FULL NAME OF SOLE OR FIRST INVENTOR Mikko LIPSANEN	SIGNATURE	DATE 04.01.2001
RESIDENCE FIN-21380 Aura, FINLAND FIX	CITIZENSHIP Finnish ✓	
POST OFFICE ADDRESS Harakkamäentie 59 B, FIN-21380 Aura, FINLAND		

2-00

FULL NAME OF SECOND JOINT INVENTOR, IF ANY Patrik Kim NILSSON	SIGNATURE	DATE 8.1.2001
RESIDENCE FIN-20500 Turku, FINLAND FIX	CITIZENSHIP ~~Finnish~~ SWEDISH ✓	
POST OFFICE ADDRESS Kellonsoittajankatu 8 B 9, FIN-20500 Turku, FINLAND		

3-00

FULL NAME OF THIRD JOINT INVENTOR, IF ANY Patrik Kjell-Johan PALM	SIGNATURE	DATE 16.1.2001
RESIDENCE Stockholm, SWEDEN SEX	CITIZENSHIP ~~Swedish~~ FINNISH.	
POST OFFICE ADDRESS Starrängsringen 42, S-115 50 Stockholm, SWEDEN		

FULL NAME OF FOURTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE
RESIDENCE	CITIZENSHIP	
POST OFFICE ADDRESS		

FULL NAME OF FIFTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE
RESIDENCE	CITIZENSHIP	
POST OFFICE ADDRESS		

FULL NAME OF SIXTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE
RESIDENCE	CITIZENSHIP	
POST OFFICE ADDRESS		

FULL NAME OF SEVENTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE
RESIDENCE	CITIZENSHIP	
POST OFFICE ADDRESS		

FULL NAME OF EIGHTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE
RESIDENCE	CITIZENSHIP	
POST OFFICE ADDRESS		

(10/(